

I. Amendments to the Claims

Please amend the claims as follows with the following version of the claims in accordance with revised 37 CFR § 1.121.

1. (Original) An horological device comprising:  
charging means for receiving and storing an electrostatic  
charge in a charge storage element in a time cell in the  
horological device, wherein the charge storage element  
5 comprises an internal medium for storing an electrostatic  
charge and an insulating medium for insulating the internal  
medium that substantially surrounds the internal medium, and  
wherein the time cell transitions from a non-time-measuring  
state to a time-measuring state in the horological device upon  
10 receiving the electrostatic charge; and  
discharging means for discharging the stored  
electrostatic charge in the charge storage element using a  
discharge process with a predetermined discharge rate.
- 15 2. (Original) The horological device of claim 1 wherein  
the predetermined discharge rate of the discharge process  
varies with an initial condition of the time cell after the  
programming operation.
- 20 3. (Original) The horological device of claim 1 wherein  
the predetermined discharge rate of the discharge process is  
non-linear with respect to time.
4. (Original) The horological device of claim 1 wherein  
25 the predetermined discharge rate of the discharge process is  
dependent upon a structure of the charge storage element.
5. (Original) The horological device of claim 1 further  
comprising:  
30 an array of time cells.

6. (Original) The horological device of claim 5 wherein  
at least one time cell in the array of time cells has a  
predetermined discharge rate that differs from a predetermined  
discharge rate of another time cell in the array of time  
5 cells.

7. (Original) The horological device of claim 5 wherein  
at least two time cells in the array of time cells have  
substantially identical predetermined discharge rates.

10 8. (Original) The horological device of claim 5 further  
comprising:

a time cell interface unit for controlling the array of  
time cells by initializing one or more time cells in the array  
15 of time cells.

9. (Original) The horological device of claim 5 further  
comprising:

20 a programming request processing unit for processing a  
programming request to set one or more time cells within the  
array of time cells.

10. (Original) A method for using an horological device, the method comprising:

receiving and storing an electrostatic charge in a charge storage element in a time cell in the horological device,  
5 thereby transitioning from a non-time-measuring state to a time-measuring state in the horological device, wherein the charge storage element comprises an internal medium for storing an electrostatic charge and an insulating medium for insulating the internal medium that substantially surrounds  
10 the internal medium; and

discharging the stored electrostatic charge in the charge storage element using a discharge process with a predetermined discharge rate.

11. (Original) The method of claim 10 further comprising:

programming at least one time cell in an array of time cells.

12. (Original) The method of claim 11 further comprising:

controlling the array of time cells through a time cell interface unit by initializing one or more time cells in the array of time cells.

13. (Original) The method of claim 11 further comprising:

processing a programming request to set one or more time cells within the array of time cells.

14. (Original) A computer program product on a computer readable medium for use in a data processing system for using an horological device, the computer program product comprising:

5 instructions for receiving a programming request to initialize the horological device; and

instructions for programming an electrostatic charge into a charge storage element in a time cell in the horological device, thereby transitioning from a non-time-measuring state to a time-measuring state in the horological device, wherein the charge storage element comprises an internal medium for storing an electrostatic charge and an insulating medium for insulating the internal medium that substantially surrounds the internal medium, wherein the stored electrostatic charge  
10 discharges from the charge storage element using a discharge process with a predetermined discharge rate.  
15

15. (Original) The computer program product of claim 14 further comprising:

20 instructions for programming at least one time cell in an array of time cells.

16. (Original) The computer program product of claim 15 further comprising:

25 instructions for controlling the array of time cells through a time cell interface unit by initializing one or more time cells in the array of time cells.

17. (Original) The computer program product of claim 15 further comprising:

30 instructions for processing a programming request to set one or more time cells within the array of time cells.

18. (Original) An horological device comprising:  
an internal medium for storing an electrostatic charge;  
an insulating medium for insulating the internal medium,  
the internal medium and the insulating medium forming a charge  
5 storage element,

wherein the insulating medium substantially  
surrounds the internal medium;

wherein the insulating medium has physical  
properties that allow a charging process for  
10 charging the internal medium with an  
electrostatic charge through the insulating  
medium;

wherein the insulating medium has physical  
properties that allow a discharge process for  
15 discharging a stored electrostatic charge from  
the internal medium through the insulating  
medium;

wherein the insulating medium has one or more  
physical properties that affect a rate of  
20 discharge in the discharge process; and

wherein at least one physical property of the  
insulating medium has been selected so that the  
discharge process discharges a stored  
electrostatic charge at a predetermined  
25 discharge rate; and

an electrostatic detector physically coupled to the  
charge storage element for allowing a detection of an  
electrical potential of the internal medium caused by a  
retained electrostatic charge in the internal medium.

19. (Original)                    The horological device of claim 18  
wherein the predetermined discharge rate is non-linear with  
respect to time.

5    20. (Original)                    The horological device of claim 18  
wherein the discharge process is Fowler-Nordheim tunneling.

21. (Original)                    The horological device of claim 18  
wherein the charging process is channel hot electron  
10    injection.

22. (Original)                    The horological device of claim 18  
further comprising:  
        a charge injector for injecting charge through the  
15    insulating medium into the internal medium.

23. (Original)                    The horological device of claim 22  
further comprising:  
        a programming unit for programming the charge storage  
20    element by operating the charge injector.

24. (Original)                    The horological device of claim 23  
further comprising:  
        a request processing unit for processing requests to  
25    program the charge storage element.

25. (Original)                    The horological device of claim 23  
further comprising:  
        a status generating unit for generating status from  
30    programming the charge storage element.

26. (Original)                    The horological device of claim 18 wherein the charge storage element is a floating gate in a floating gate field effect transistor.



27. (Original) A method for using an horological device, the method comprising:

programming a charge storage element in the horological device by storing an electrostatic charge within the charge storage element, wherein the charge storage element comprises an internal medium for storing an electrostatic charge and an insulating medium for insulating the internal medium,

wherein the insulating medium substantially surrounds the internal medium;

wherein the insulating medium has physical properties that allow a charging process for charging the internal medium with an electrostatic charge through the insulating medium;

wherein the insulating medium has physical properties that allow a discharge process for discharging a stored electrostatic charge from the internal medium through the insulating medium;

wherein the insulating medium has one or more physical properties that affect a rate of discharge in the discharge process; and wherein at least one physical property of the insulating medium has been selected so that the discharge process discharges a stored electrostatic charge at a predetermined rate;

and

discharging the stored electrostatic charge from the charge storage element.

28. (Original)                      The method of claim 27 further  
comprising:

programming the charge storage element by injecting  
charge through the insulating medium into the internal medium.

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29. (Original)                      The method of claim 27 further  
comprising:

processing requests to program the charge storage  
element.

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30. (Original)                      The method of claim 27 further  
comprising:

generating status after attempting to program the charge  
storage element.

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31. (Original)                      The method of claim 27 wherein the  
charge storage element is a floating gate in a floating gate  
field effect transistor.

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32. (Canceled)

33. (Canceled)

34. (Canceled)

35. (Canceled)

36. (Canceled)

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37. (Canceled)

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39. (Canceled)

40. (Canceled)

41. (Previously Presented) An article of manufacture comprising:

an analog time cell; and

a conductive lead for allowing a state of the analog time cell to be modified or read.

42. (Original) The article of manufacture of claim 41 wherein the analog time cell transitions from a non-time-measuring state to a time-measuring state upon receiving an electrostatic charge.

43. (Original) The article of manufacture of claim 41 wherein the article of manufacture is a smart card.

44. (Original) The article of manufacture of claim 41 further comprising:

coupling means for coupling the article of manufacture to a reading device or programming device.

45. (Original) The article of manufacture of claim 41 further comprising:

time determining means for determining an elapsed time period since the analog time cell was programmed.